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Measuring Pain And Conditioned Pain Modulation After Ankle Sprain With A Spring Clamp

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INTRODUCTION

It is estimated that one ankle sprain occurs for every 10.000 people/day in Denmark and constitute 7-10% of all admissions to hospital emergency departments.

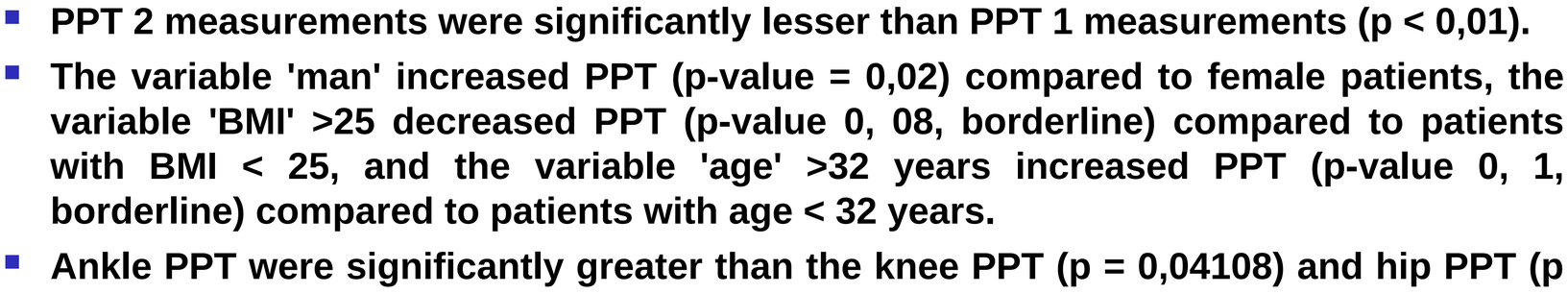
OBJECTIVES

This study was conducted to determine whether pressure pain threshold (PPT) measurement of ankle sprain patients may be an instrument in understanding and analyzing pain, and if a spring-clamp would affect pain sensitivity and pain modulation after ankle sprain.

METHODS

- **After ankle sprain 18 female and 14 male were included.**
- **Pressure pain thresholds (PPT) were measured on spina iliaca anterior superior, epicondylus medialis femoris and malleolus lateralis on the non-injured side of the body (PPT 1) with a handheld algometer.**
- **Sustained mechanical pressure was applied by a spring-clamp as a stimulus of conditioned pain modulation (CPM) after which PPT2 was measured.**

The spring-clamp was placed on the left thumbnail for 10 seconds. Attention to the placement of the spring-clamp was important. The upper pad was placed as far proximal on the nail as possible without covering the eponychium and the lower pad proximal enough to prevent the clamp for sliding off. After 10 seconds the participant were asked to score the pain intensity on a VAS. A pressure test of 100 spring-clamps showed that these on average exertec a pressure of 3.54 kg/cm2 (SD=0.39)



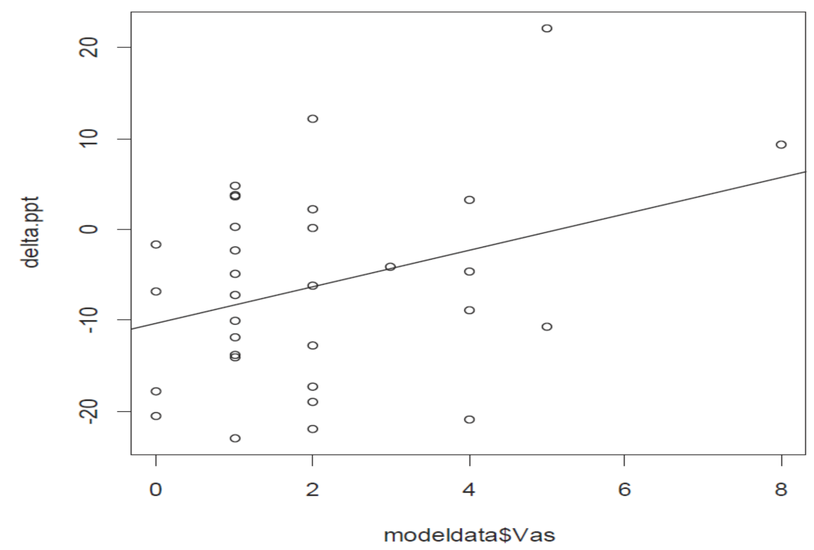
RESULTS

- **PPT 2 measurements were significantly lesser than PPT 1 measurements (p < 0,01).**
- **The variable 'man' increased PPT (p-value = 0,02) compared to female patients, the variable 'BMI' >25 decreased PPT (p-value 0, 08, borderline) compared to patients with BMI < 25, and the variable 'age' >32 years increased PPT (p-value 0, 1, borderline) compared to patients with age < 32 years.**
- **Ankle PPT were significantly greater than the knee PPT (p = 0,04108) and hip PPT (p = 0,006).**
- **Only the variable VAS had a borderline significance (p-value = 0,0631) when compared to the percentage difference in PPT ((PPT2-PPT1) / PPT1).**
- **The result of a simple linear regression analyses concludes in the equation that PPT = 2,004*VAS – 10,308.**

CONCLUSIONS

Acording to the equation a VAS score < 5 will result in a negative outcome (PPT2 eill be lesser that PPT1), which indicates that the patient is not exposed to sufficient intense pain to have to ahve an impact on pain modulation and activation of conditioned pain modulatio (CPM). Thus in the current study most of the patients did not experience sufficient pain from the spring clamp to activate CPM.

A spring-clamp was not able to affect pain sensitivity or modulation after ankle sprains. This study supports how different variables may influence PPT and CPM.



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